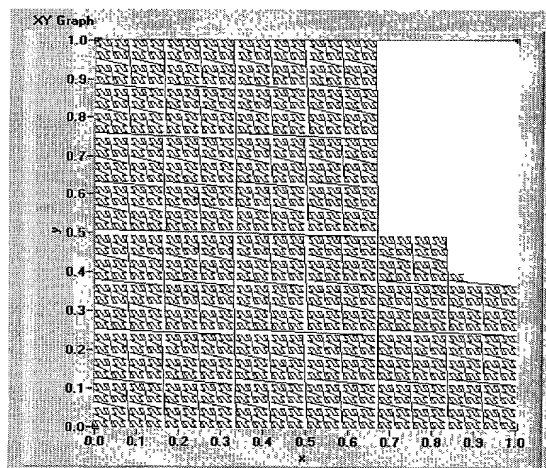
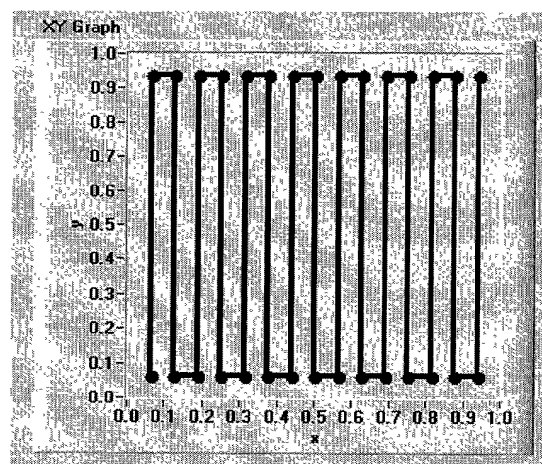


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T08090 08692050



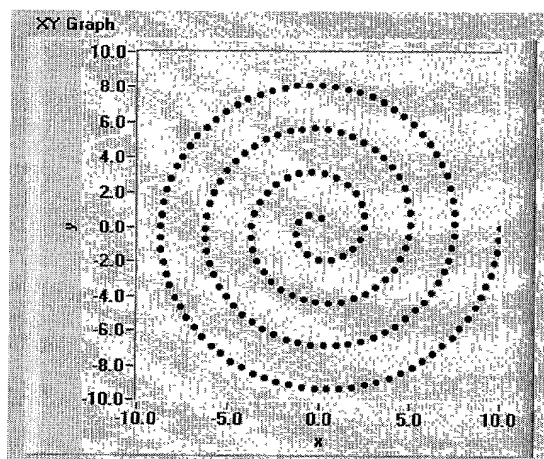
Approximated Peano Curve. The space-filling process has not been completed.

Figure 1A (Prior Art)



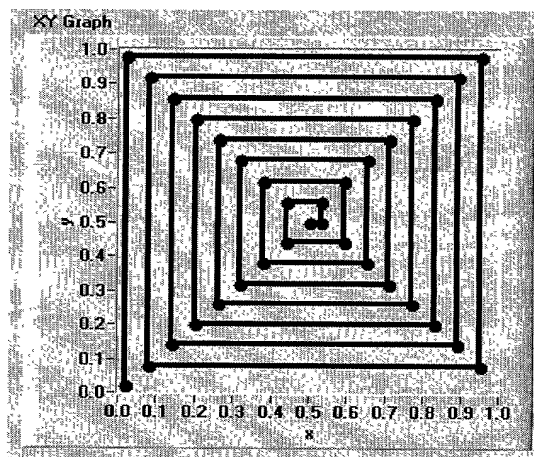
Boustrophedon Path

Figure 1B (Prior Art)



Archimedes Spiral defined by equally distributed points

Figure 1C (Prior Art)



Spiral-like line-based scanning

Figure 1D (Prior Art)

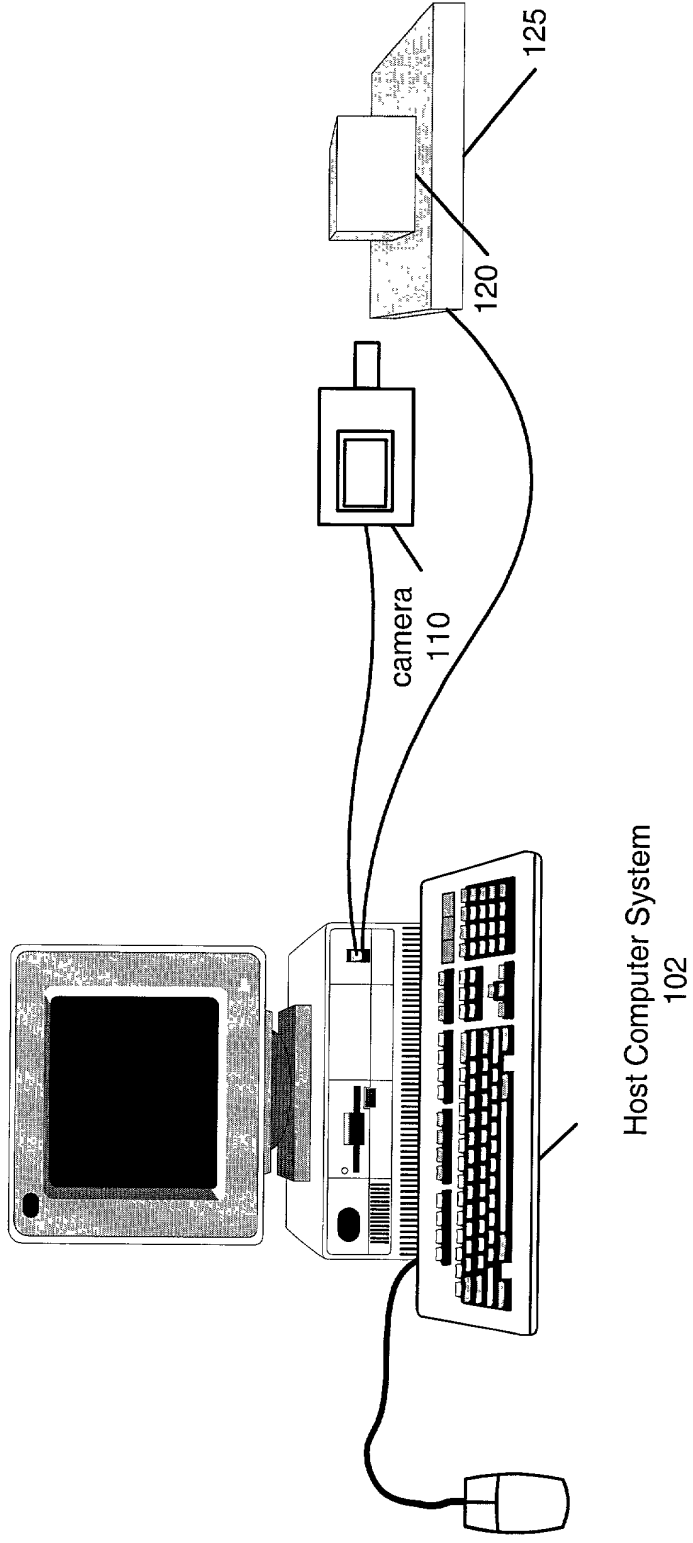


Figure 2A

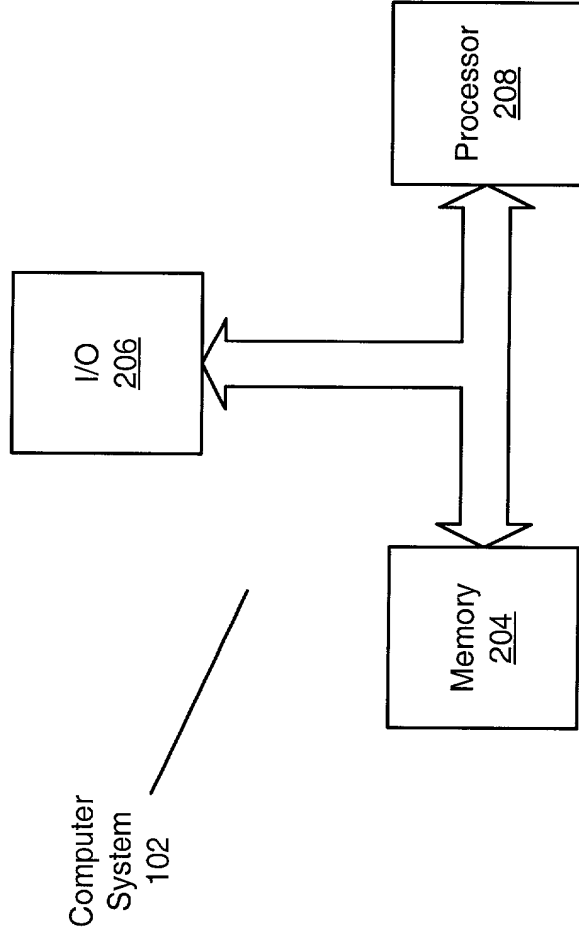


Figure 2B

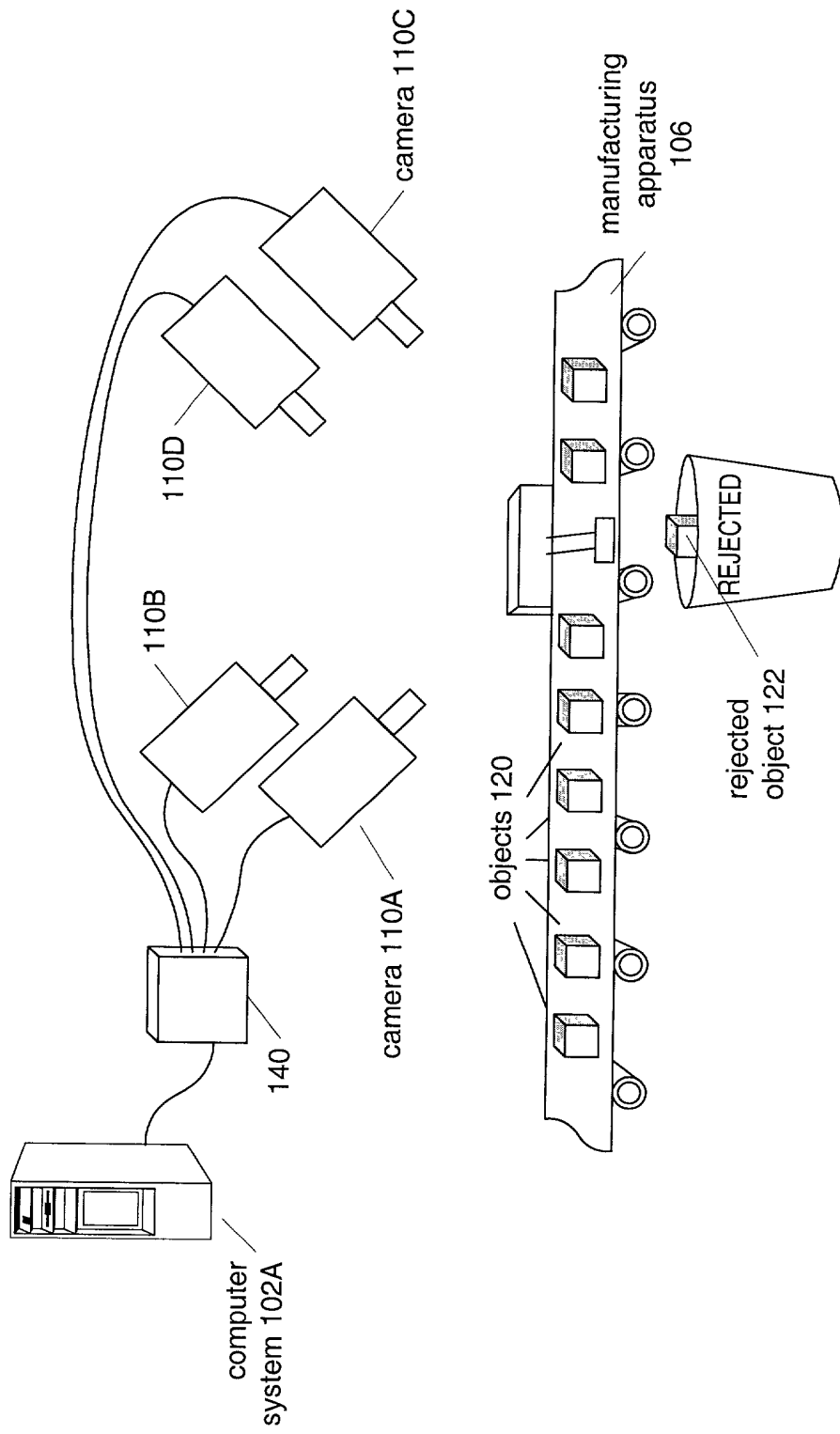


Figure 3A

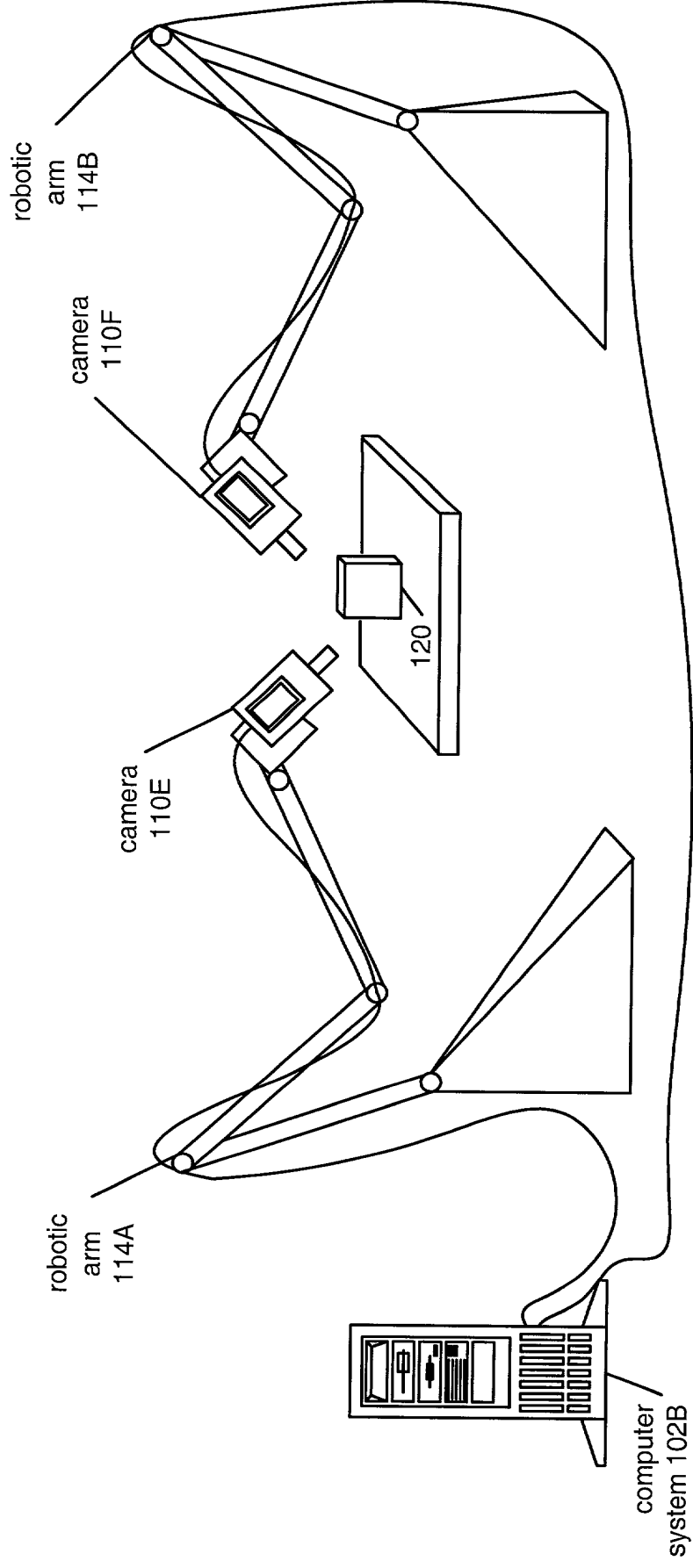


Figure 3B

Parameter	Value	Unit
Temperature	25.0	°C
Pressure	1.0	atm
Flow rate	1.0	L/min
Concentration	0.1	mol/L
pH	7.0	
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.5	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.5	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.5	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.5	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
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Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.5	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.5	nm
Detector	Photodiode array	
Injection volume	10	μL
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Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.5	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
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Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.5	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.5	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.5	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.5	nm
Detector	Photodiode array	
Injection volume	10	μL
Column	C18	
Mobile phase	Water/Acetonitrile	
Gradient	0-100% ACN in 10 min	
Flow rate	1.0	mL/min
Temperature	30.0	°C
Wavelength	254	nm
Scan rate	1.0	nm/min
Integration time	1.0	s
Resolution	0.5	

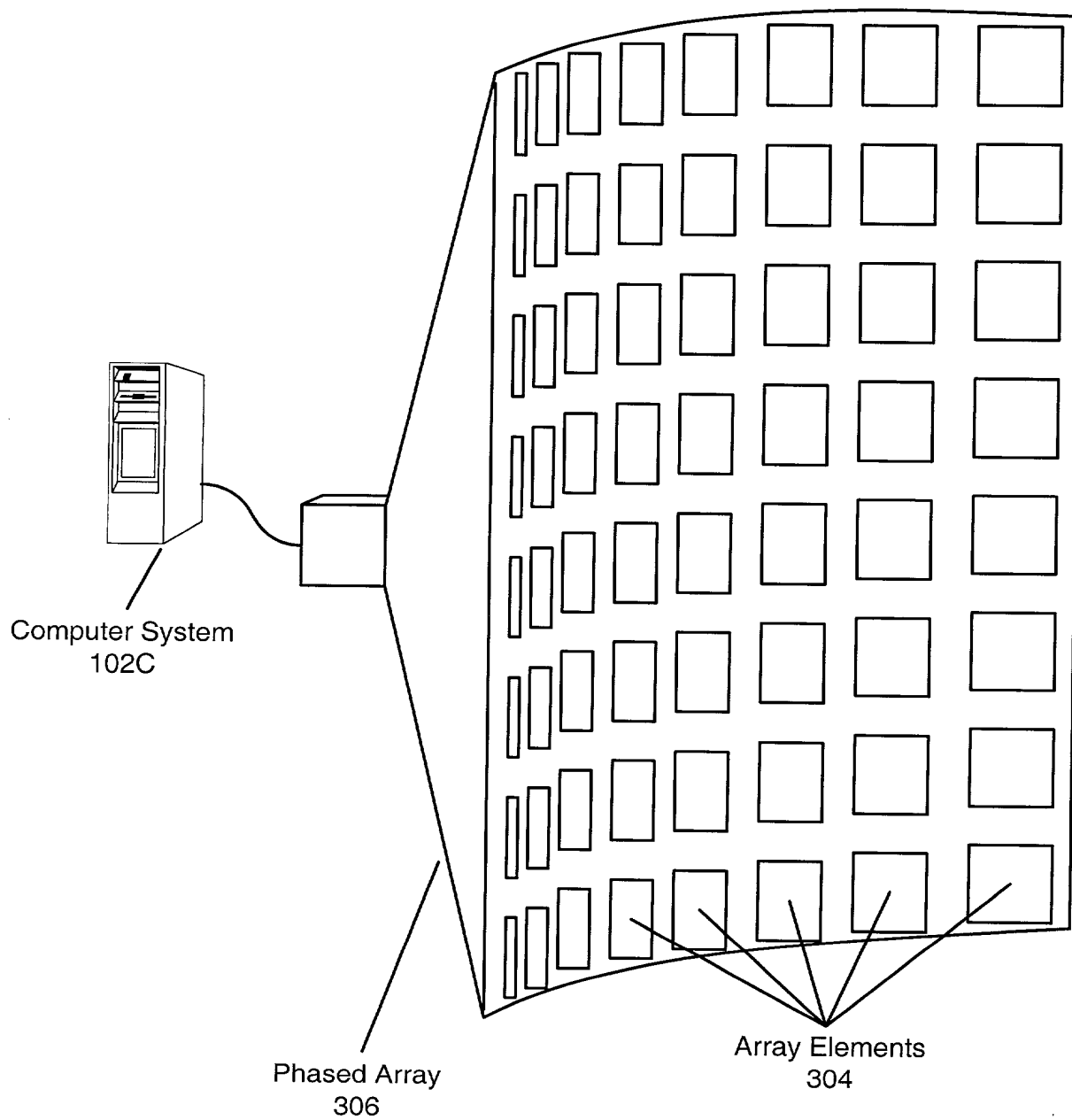


Figure 3C

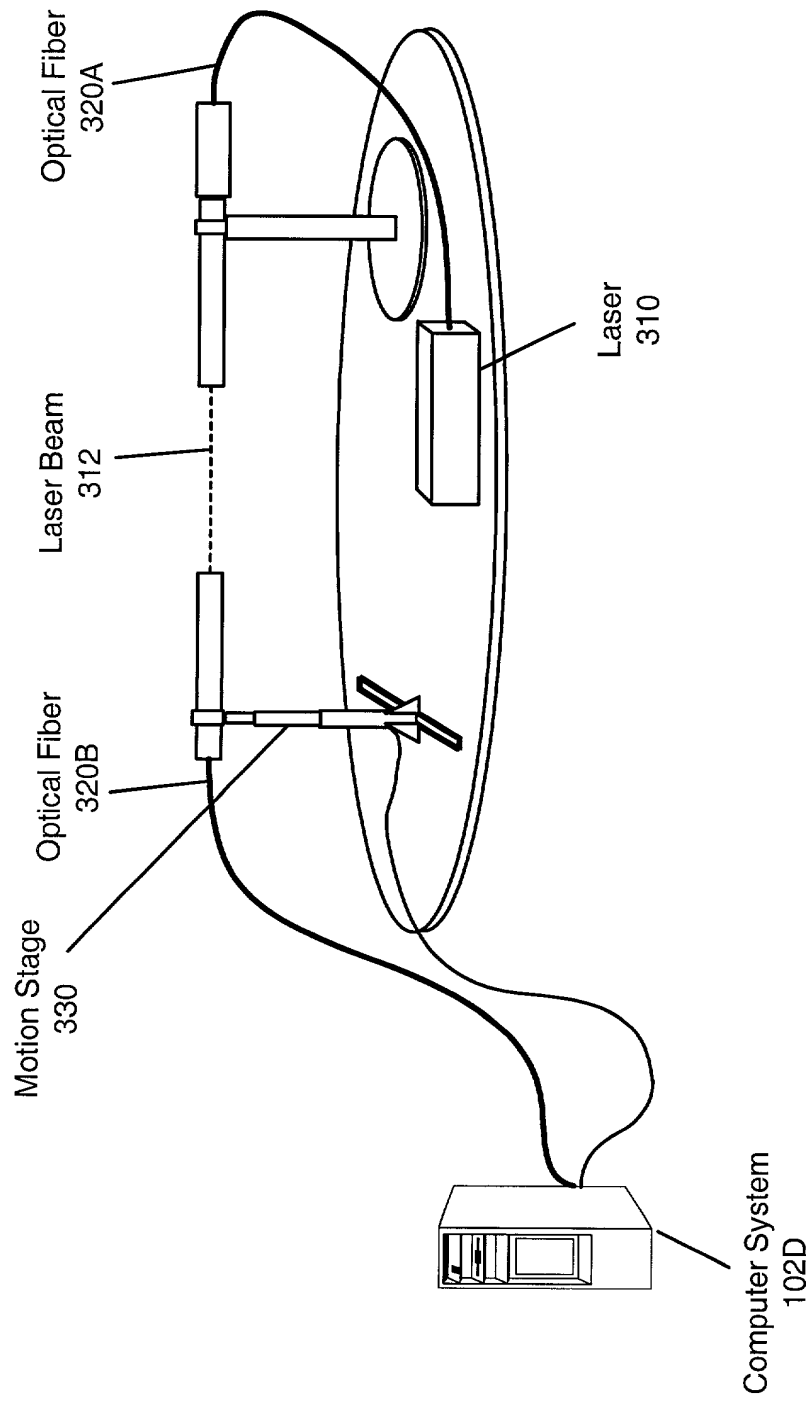
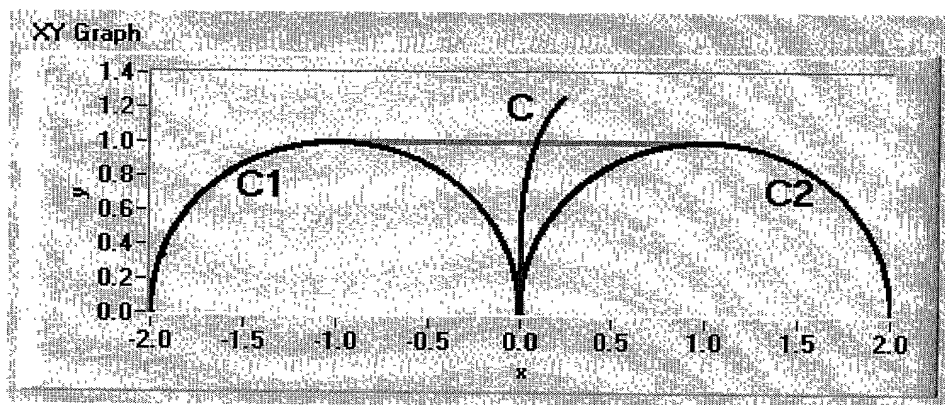
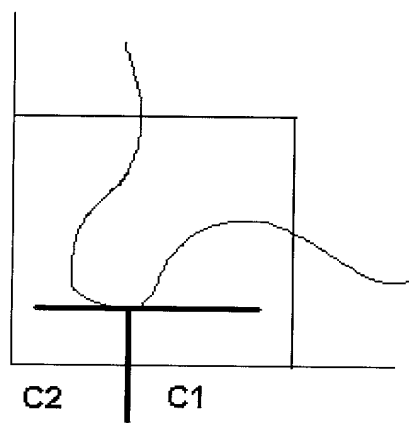


Figure 3D



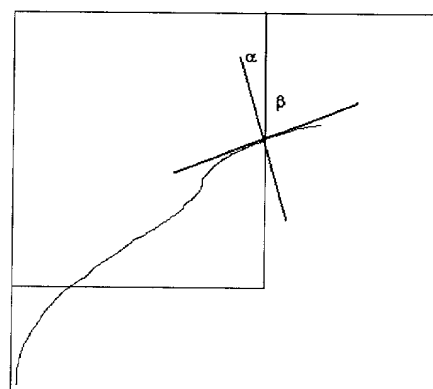
The situation of Lemma 1

Figure 4A



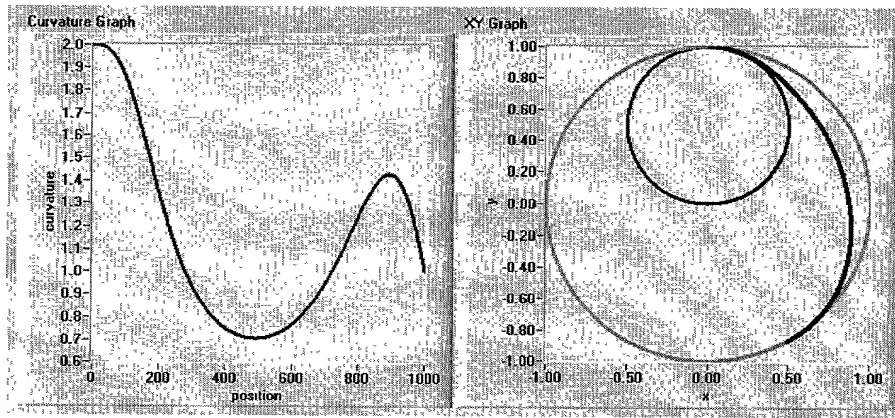
Case (A)

Figure 4B

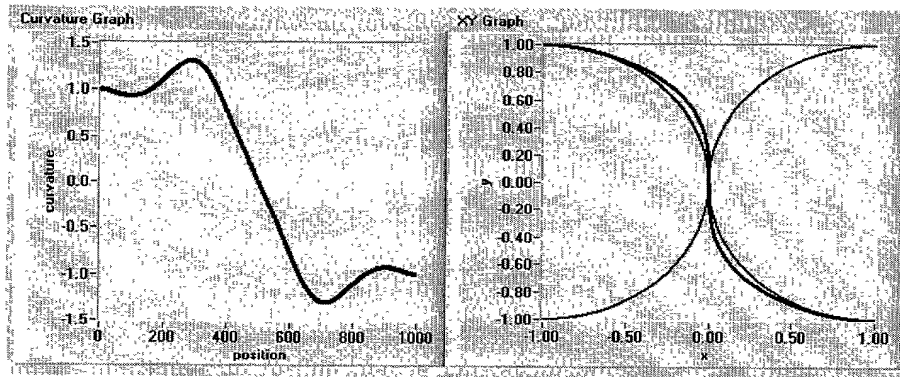


Case (B)

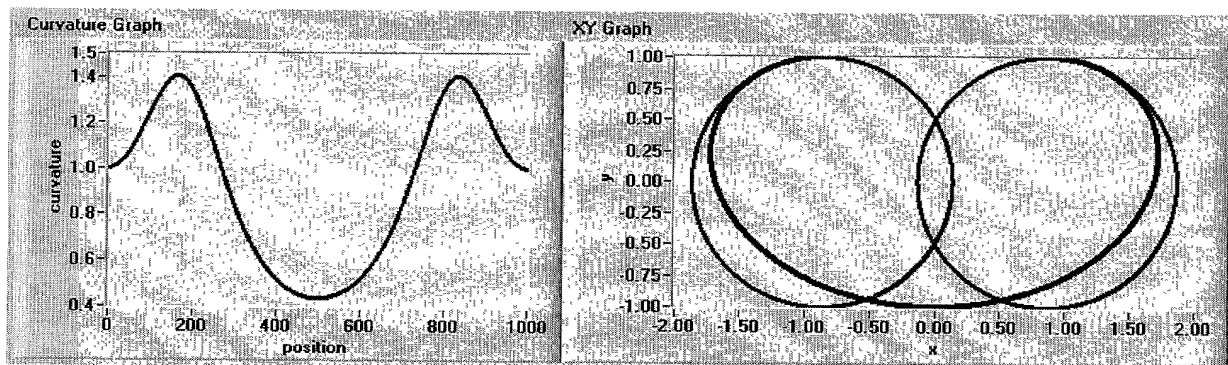
Figure 4C



Smooth transition between two circles of different radii.
Figure 4D



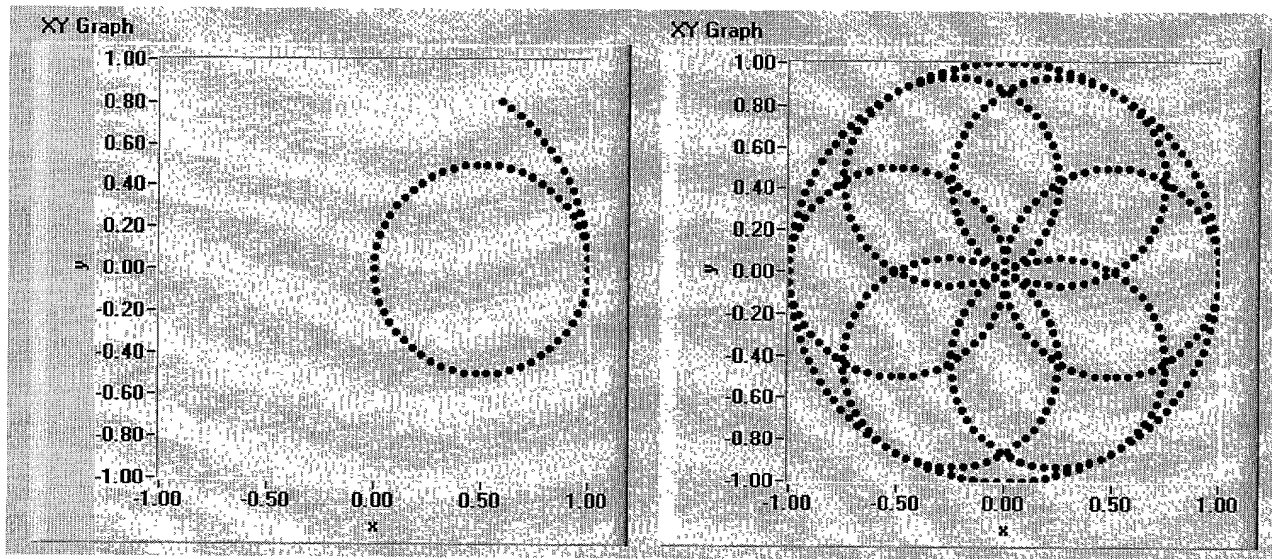
Smooth transition between two circles of same radius.
Figure 4E



Transition between two unit circles of radius 1. The distance between the circles is $\sqrt{3}$

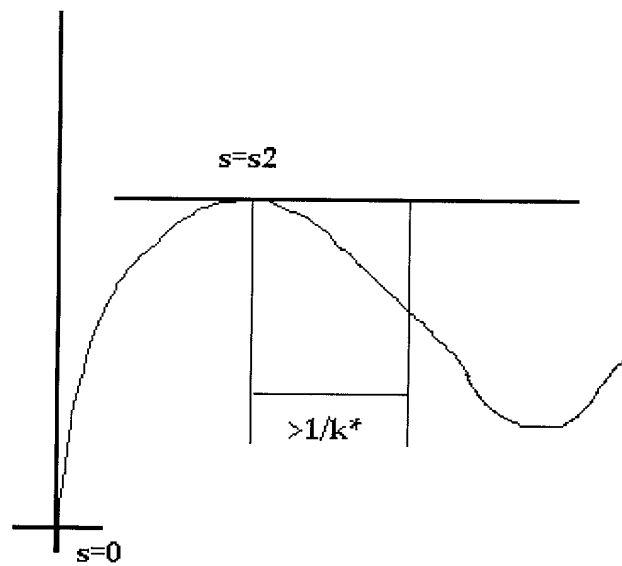
Figure 4F

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Beginning (left) and completion (right) of a scanning scheme where the curvature is below a certain value

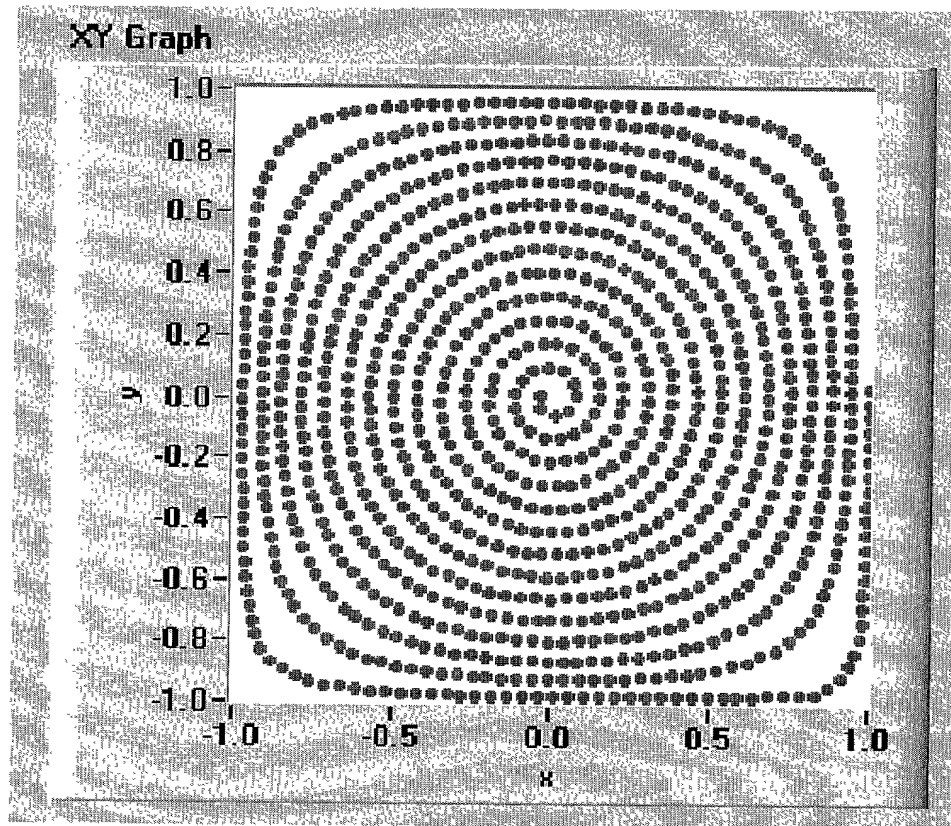
Figure 5A



Construction of $s2$ and the subsequent part of the curve

Figure 5B

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Conformal Spiral.

Figure 6

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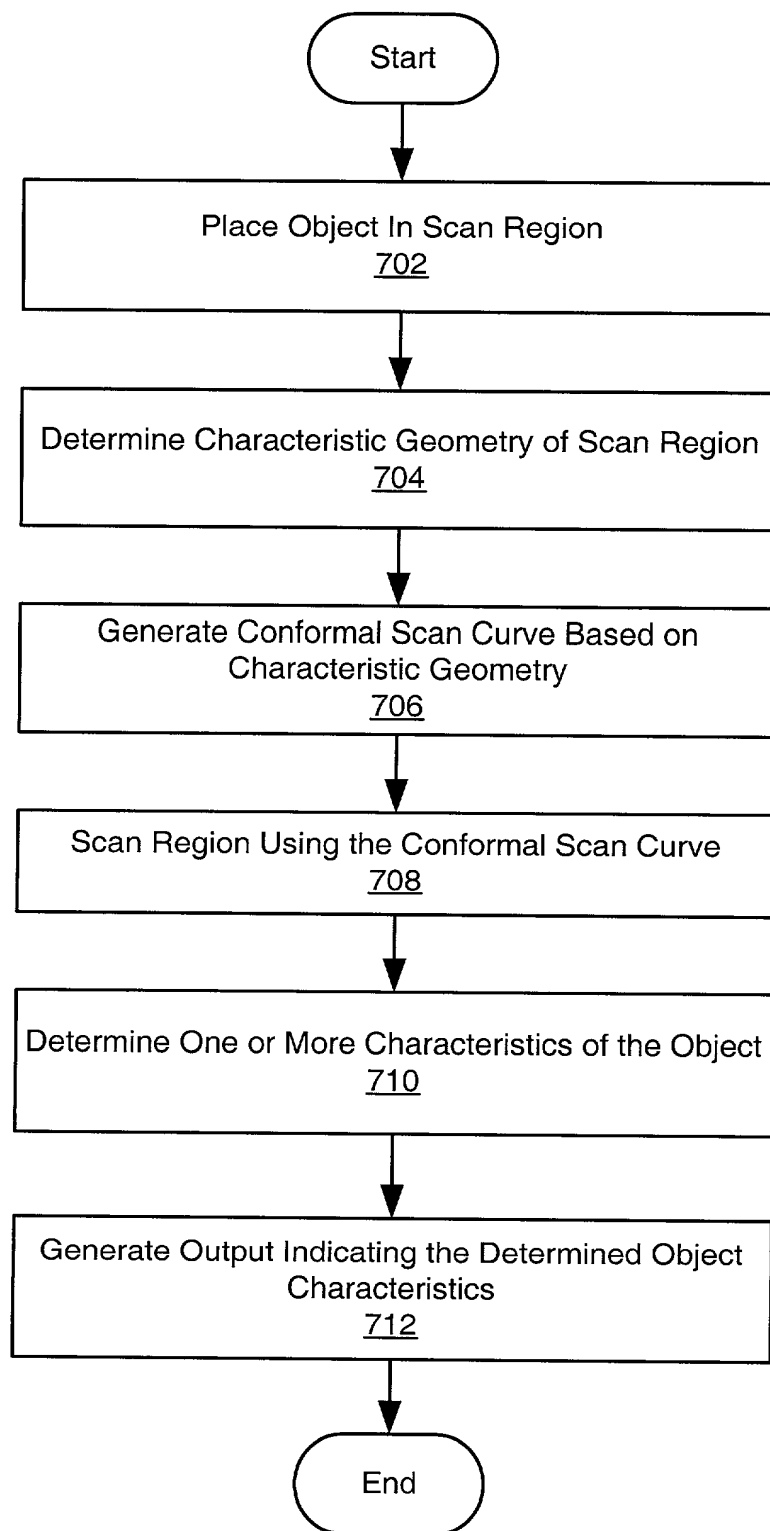
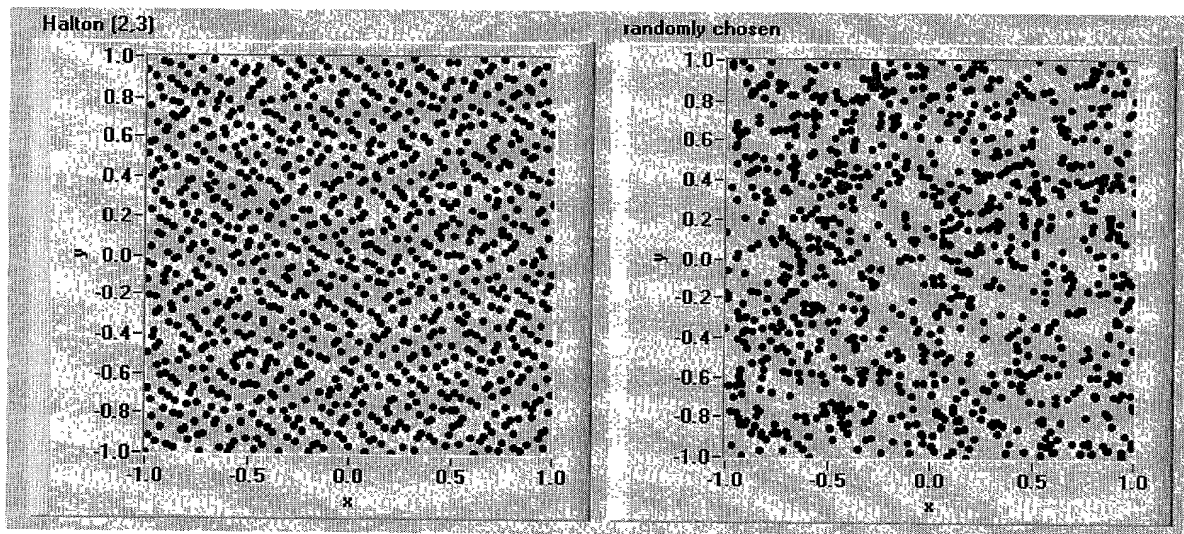
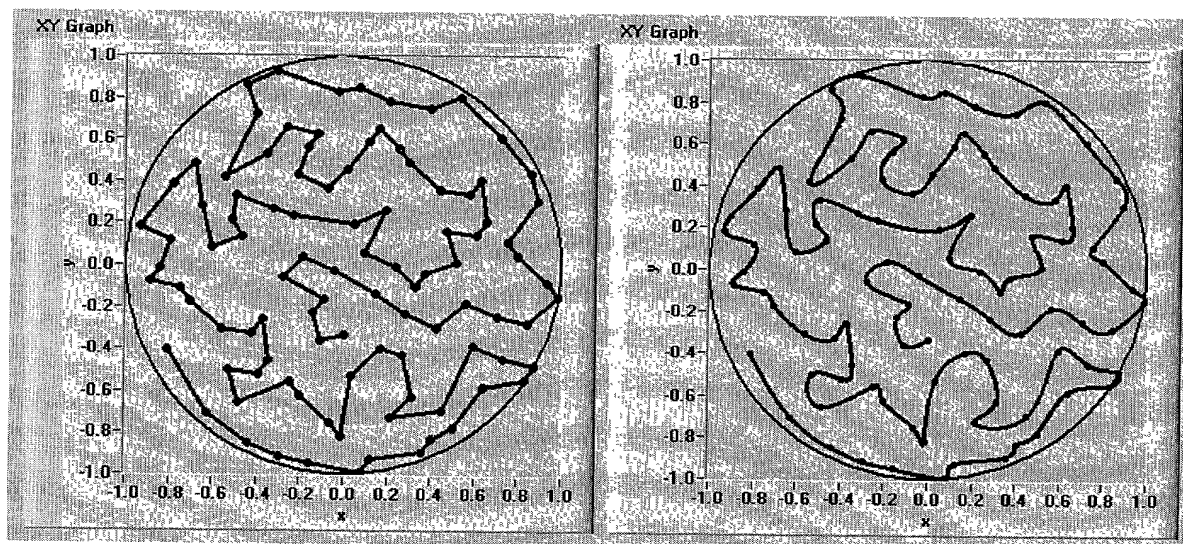


Figure 07



The first 1000 Halton points (left) and randomly chosen points (right)

Figure 8A



Original solution (left) and splined version (right).

Figure 8B

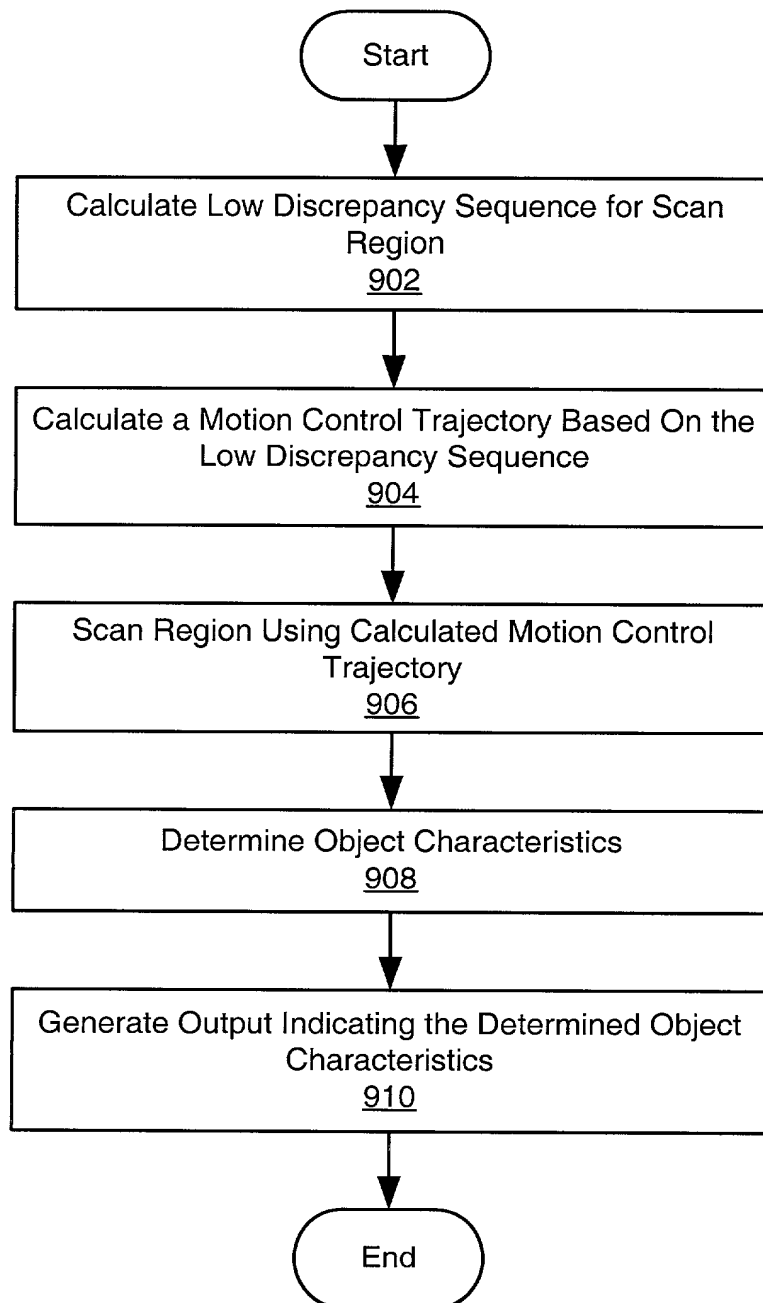
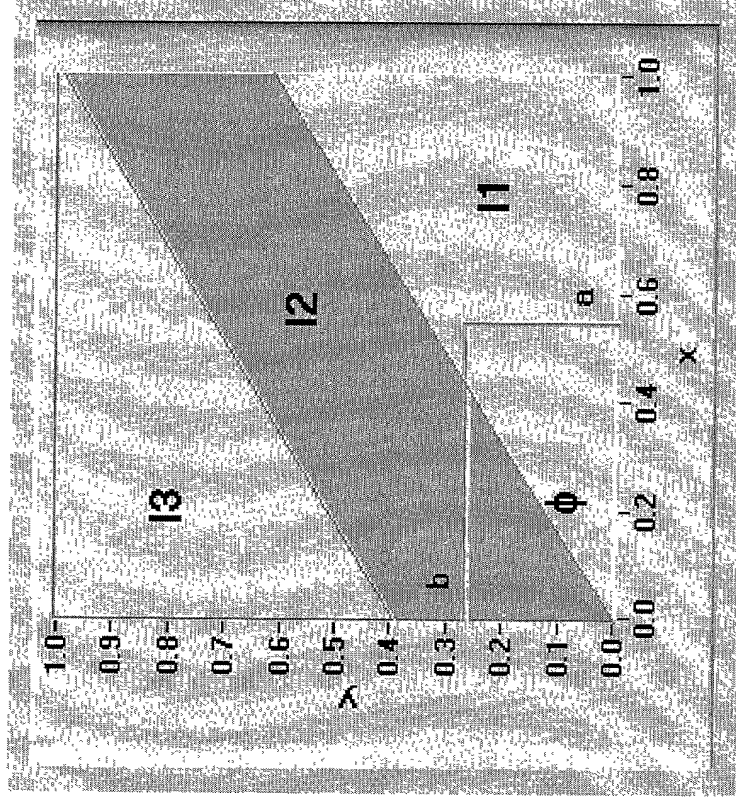


Figure 9



Definition of I_1 , I_2 , and I_3

Figure 10

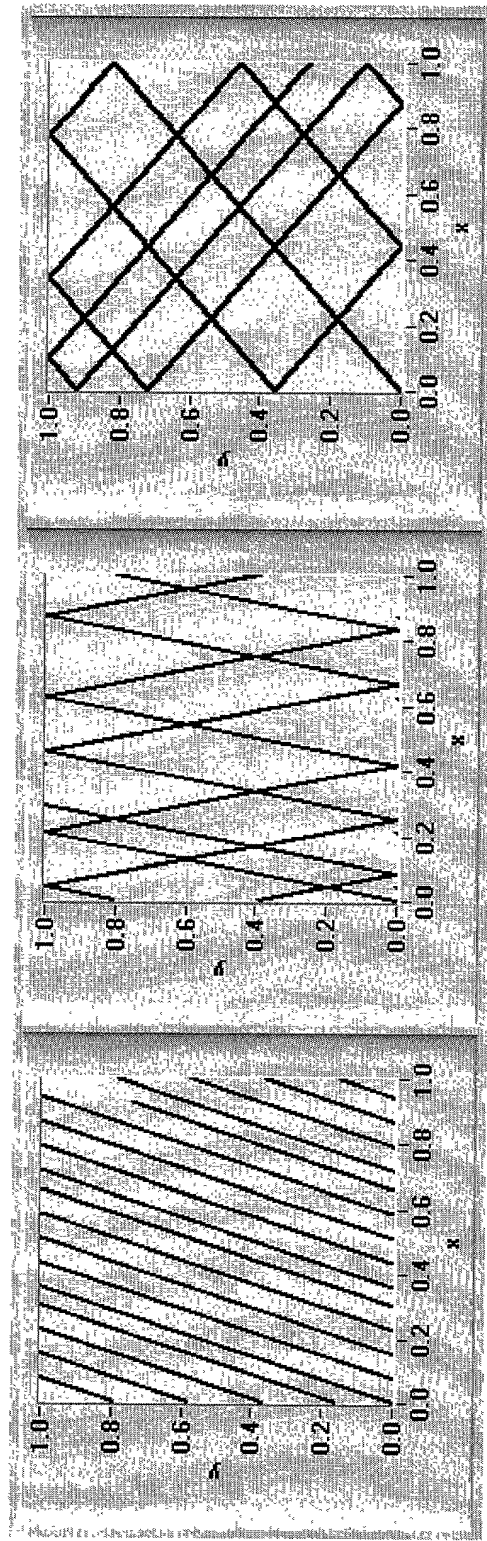


Figure 11A

Figure 11B

Figure 11C

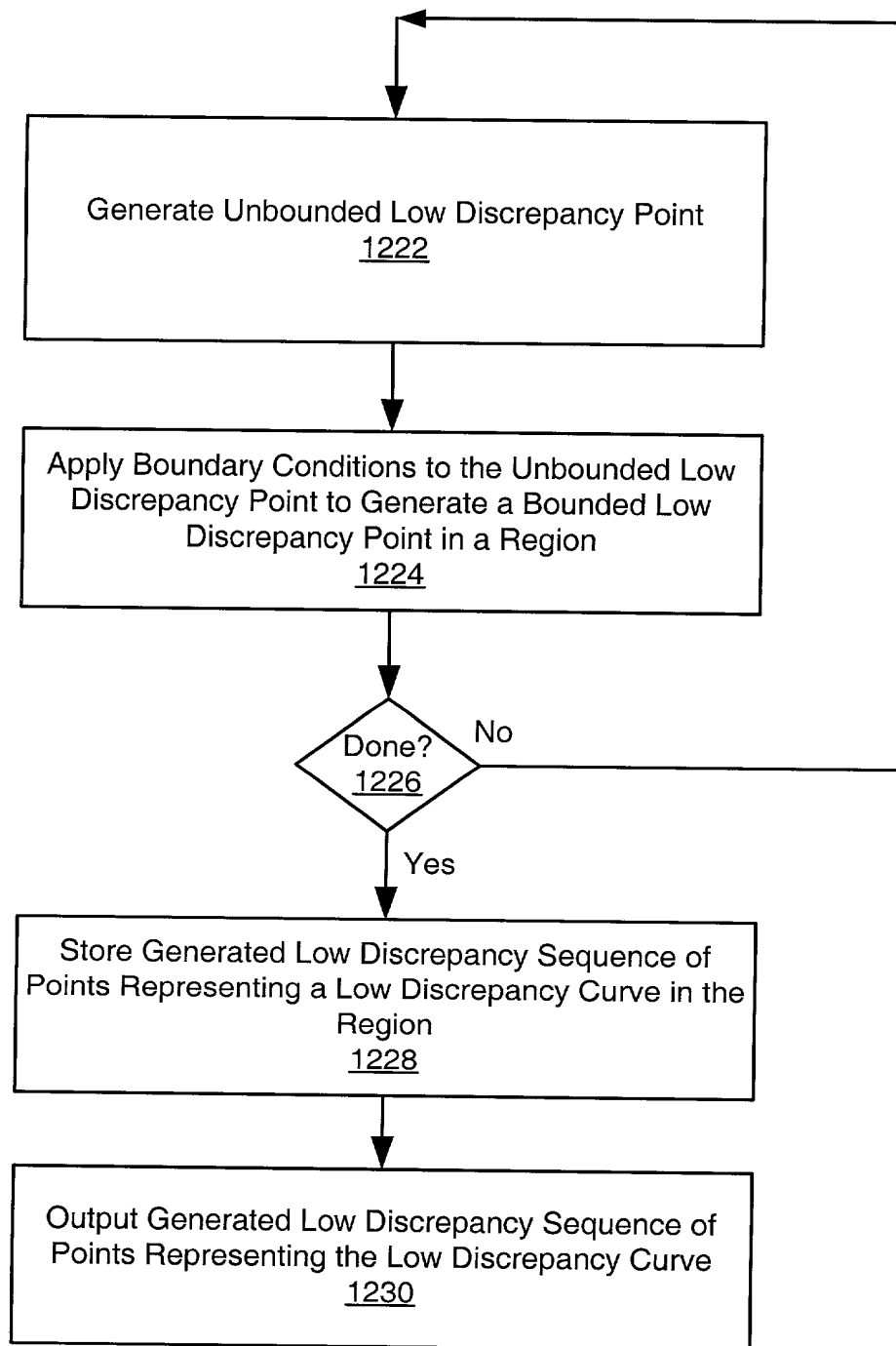


Figure 12A

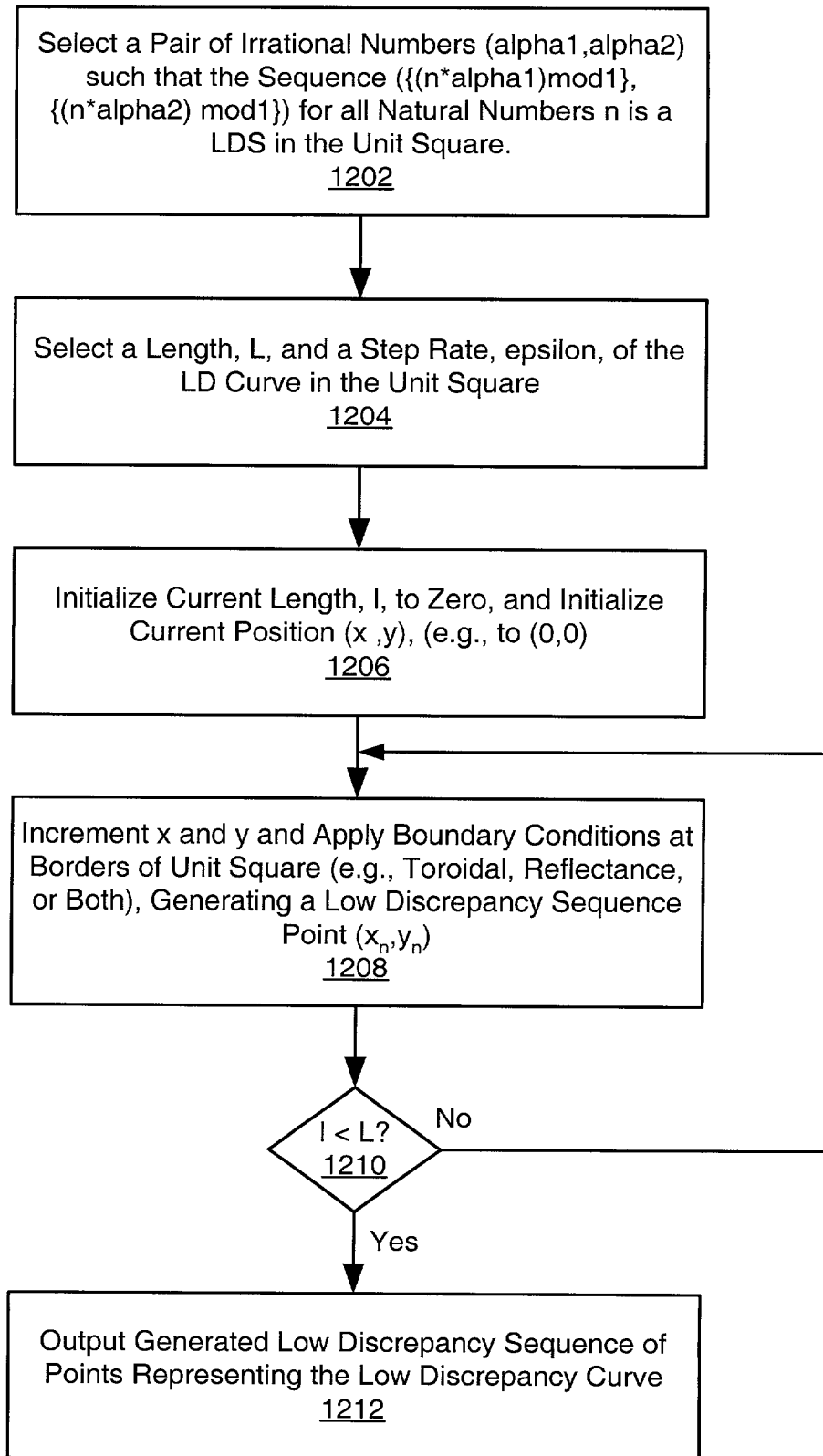
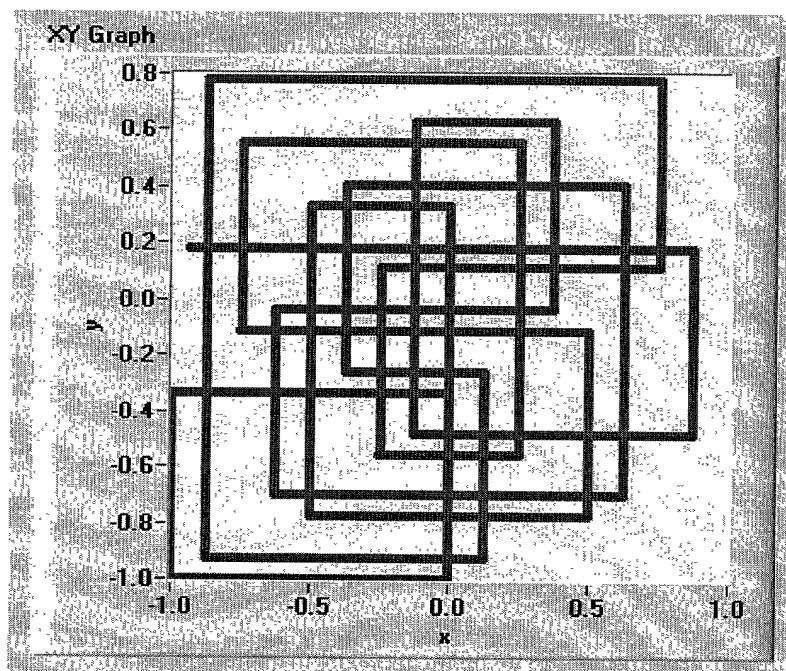


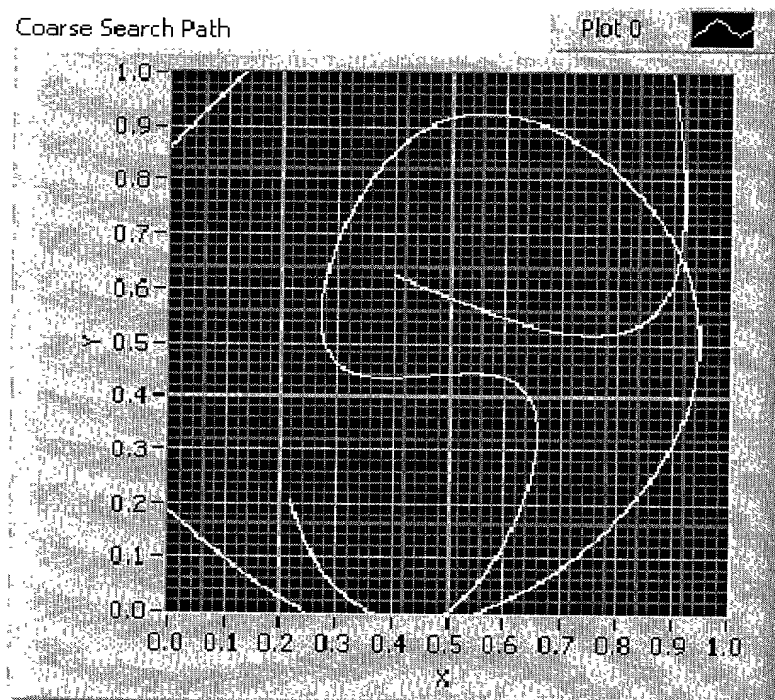
Figure 12B

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Beginning of a Low Discrepancy Curve based on a specific Halton Sequence in 2d

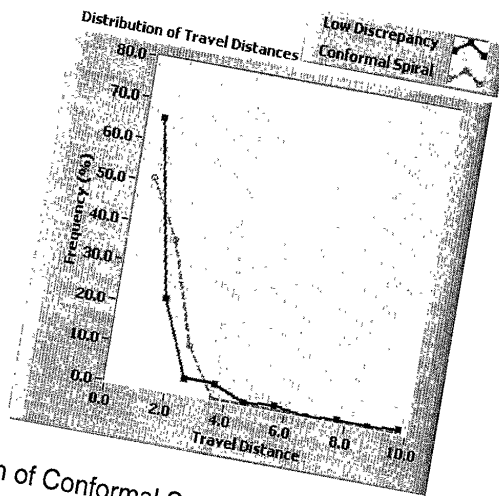
Figure 13A



Splined Low Discrepancy Curve coarse search

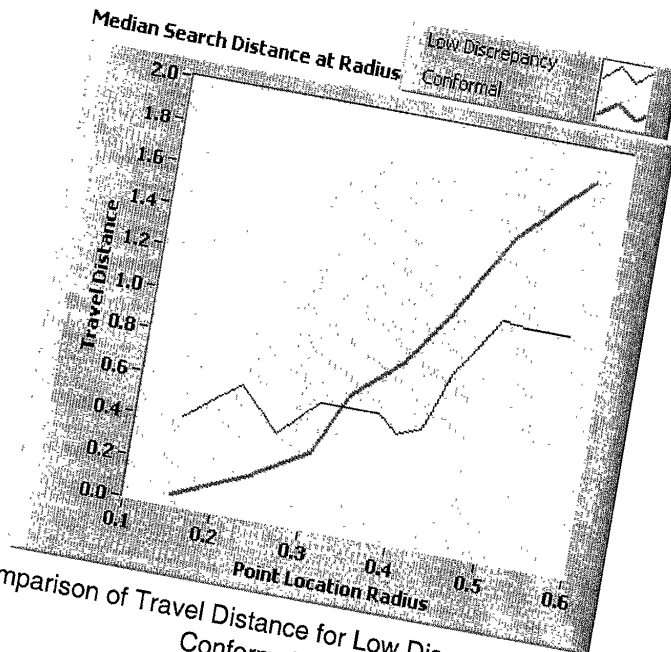
Figure 13B

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Comparison of Conformal Spiral and Low Discrepancy Searching

Figure 13C



Comparison of Travel Distance for Low Discrepancy Search and Conformal Spiral Search

Figure 13D

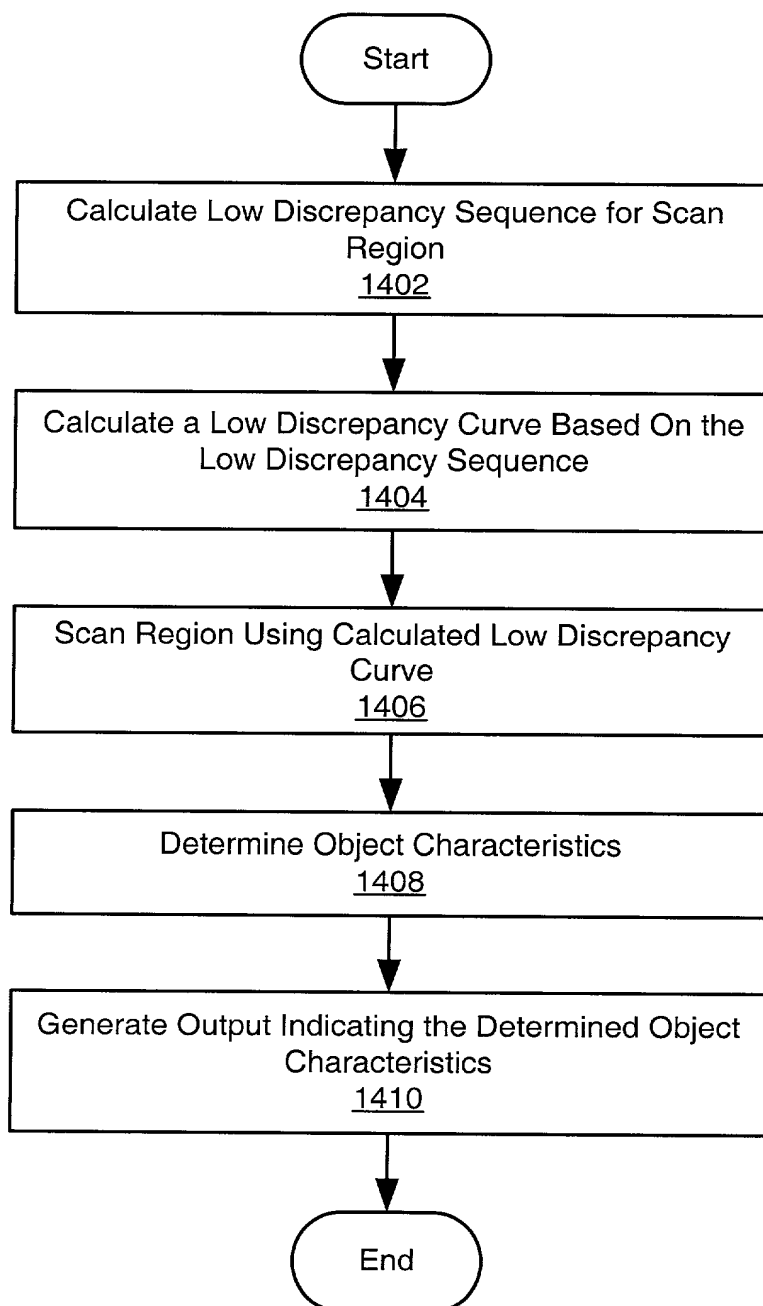
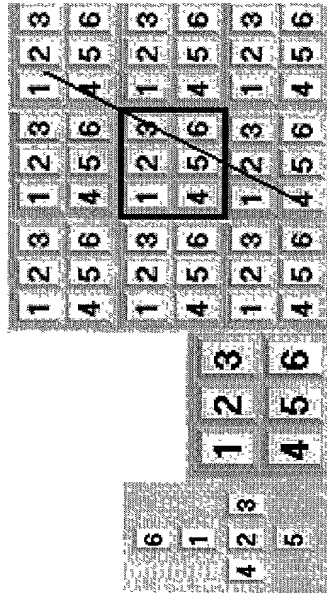
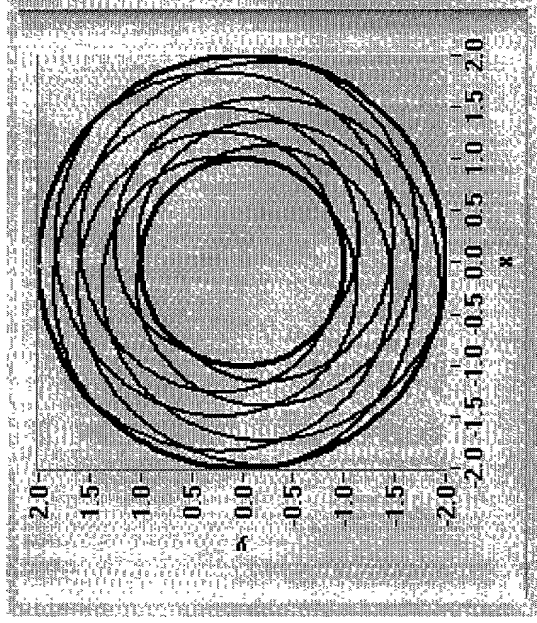


Figure 14



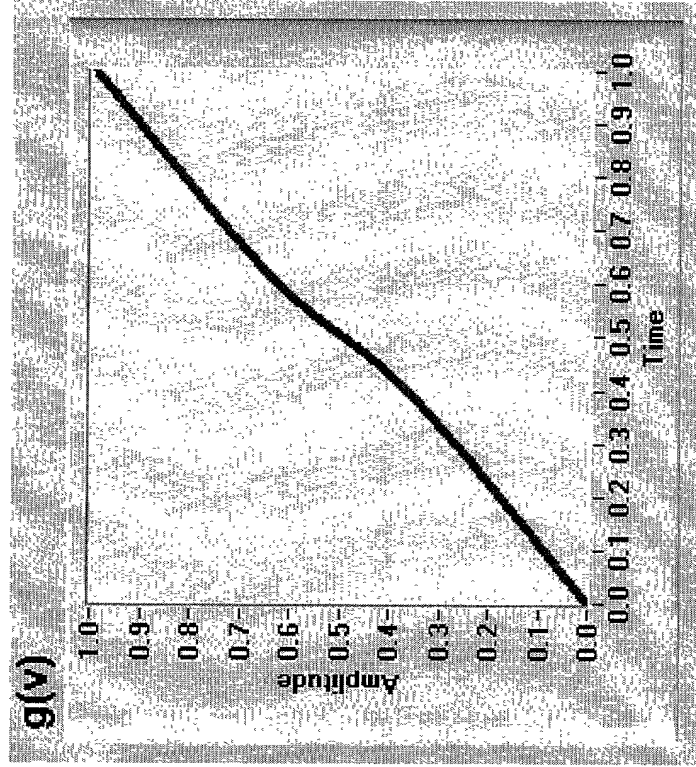
Tiling of the plane and relation to the surface of the unit cube



Low-discrepancy curve in a ring

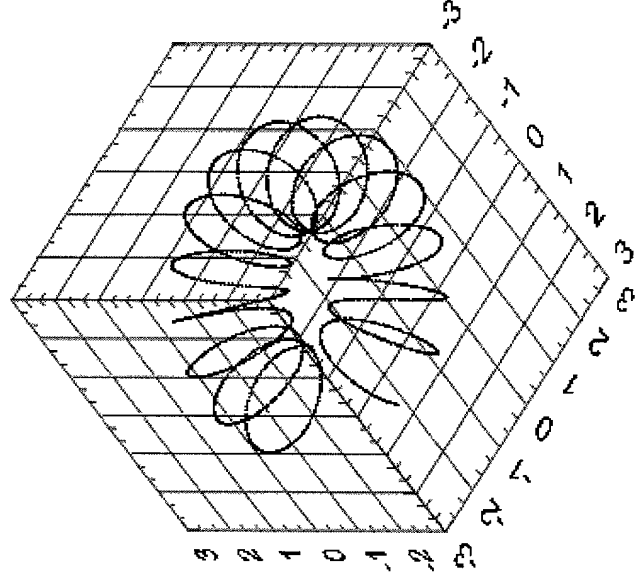
Figure 15A

Figure 15B



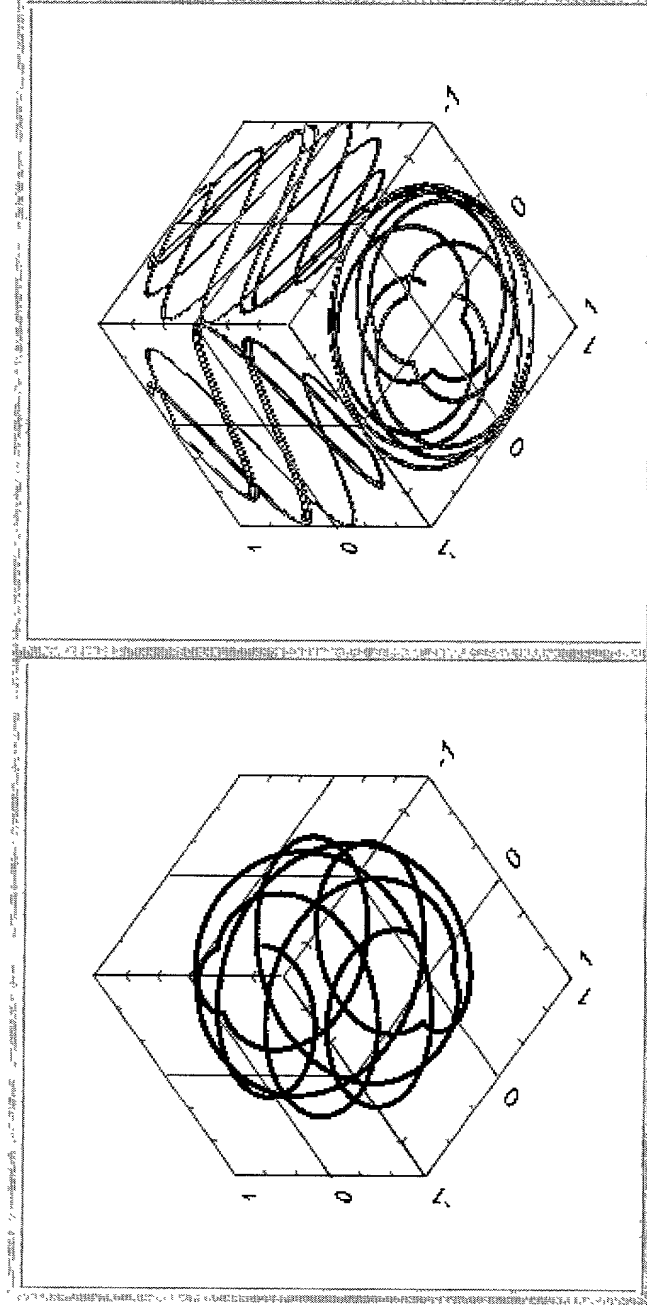
Low Discrepancy Preserving Mapping Function

Figure 15C



Low-discrepancy curve filling the surface of a torus

Figure 15D



Low-discrepancy curve on a sphere
(left) and projections (right)

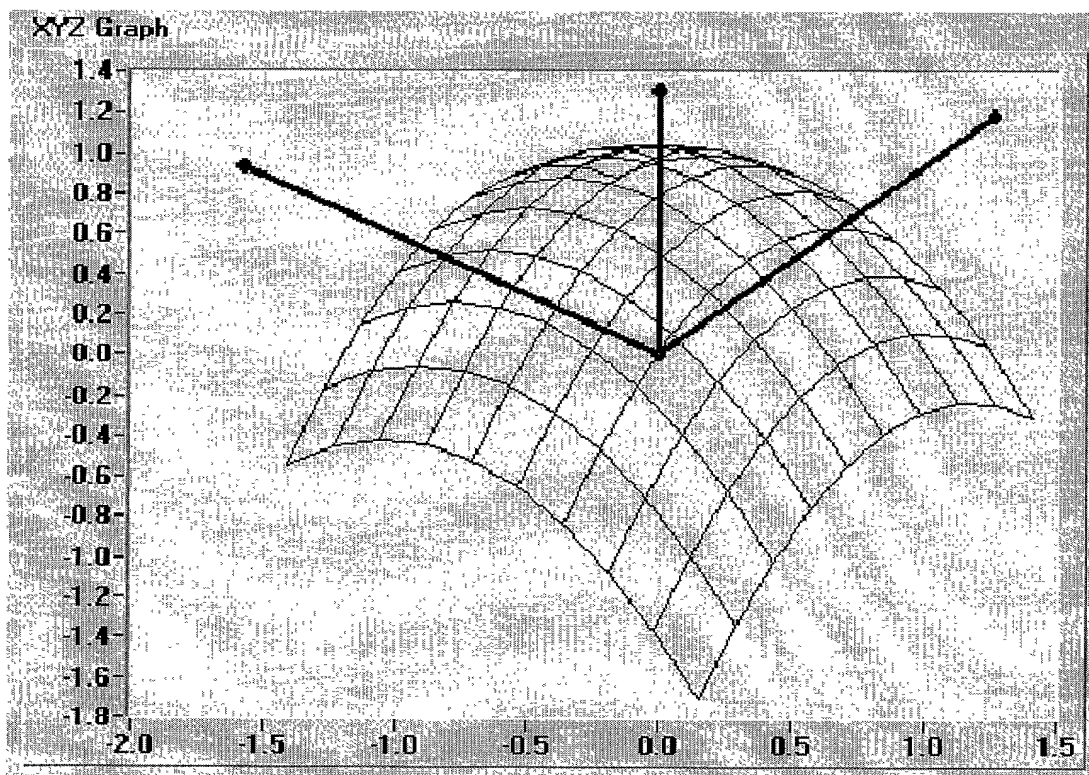
Figure 16


```

graph TD
    1702[Select a Parameterization of a Surface S Where the  
Parameter Space is the Unit Square  
1702] --> 1704[Select a LD Curve in the Parameter Space, i.e.,  
Select a Suitable (alpha1, alpha2)  
1704]
    1704 --> 1706[Determine a Re-Parameterization of S Such That  
the Ratio of Line and Area Elements of S, Based on  
a Riemannian Metric, is Constant  
1706]
    1706 --> 1708[Map the LD Curve in the Unit Square onto the  
Surface S Using the Re-Parameterization  
1708]
    1708 --> 1710[Output the Mapped LD Curve on S  
1710]

```

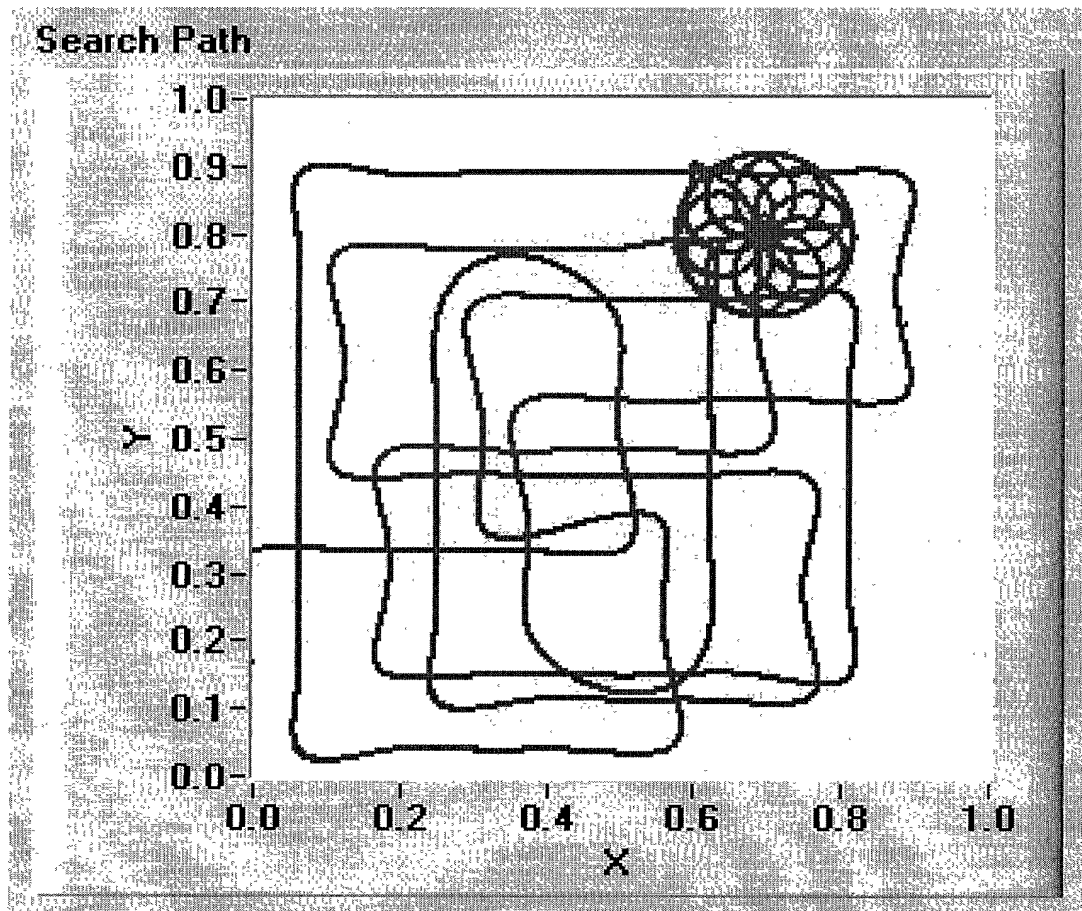
Figure 17



Surfaces can be scanned efficiently when the term low discrepancy sequence/ curve can be generalized, e.g. based on metrics on the surface.

Figure 18

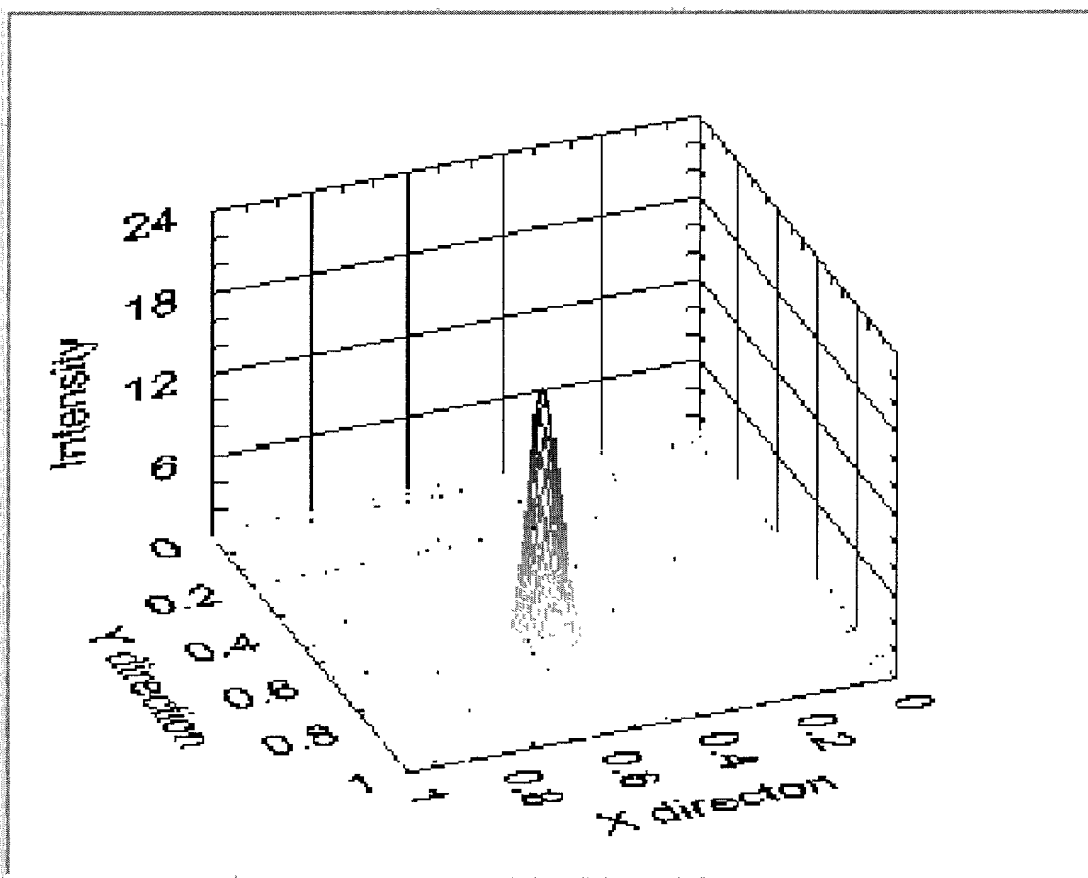
09876980.060801



Splined Low Discrepancy Curve coarse search with refined final approach

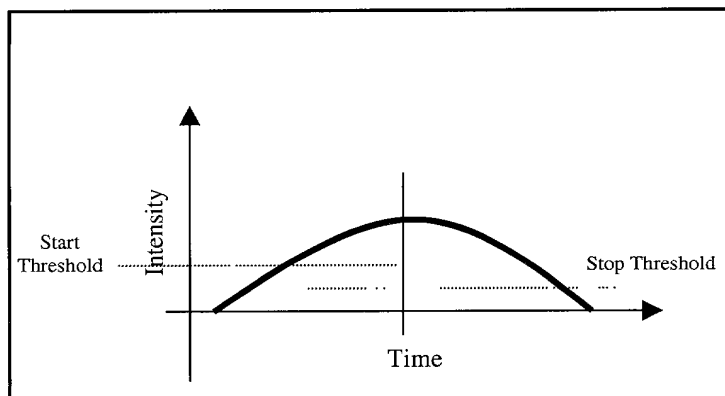
Figure 19

Intensity Field Distribution in Search Area

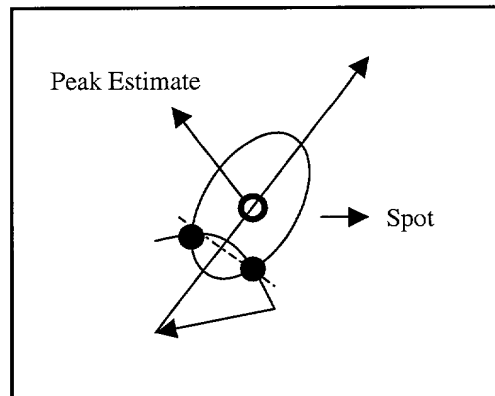


Beam intensity distribution in search area

Figure 20



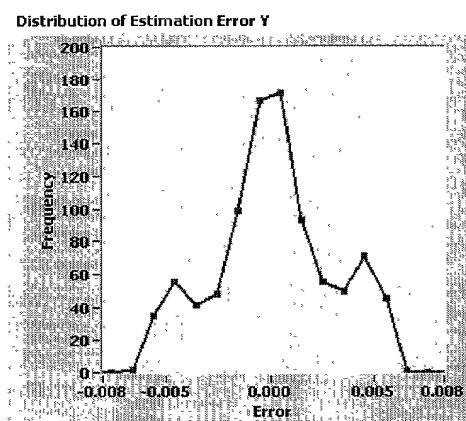
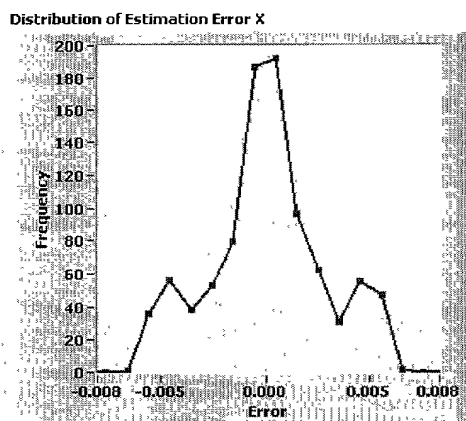
Location of the Peak



Initial Final Approach Move

Figure 21A

Figure 21B



Error distribution of the estimated peak X coordinate error (left) and Y coordinate error (right)

Figure 21C

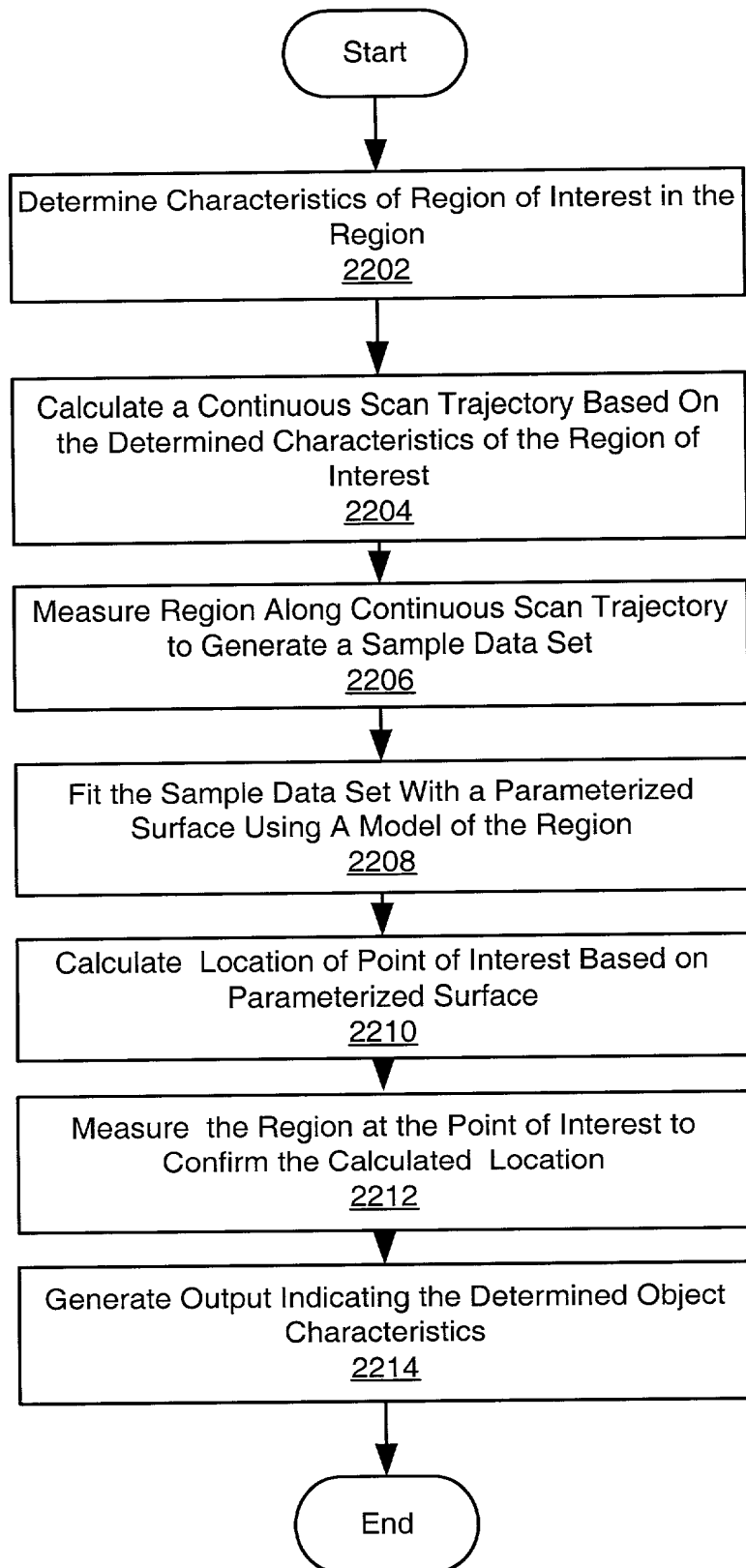


Figure 22

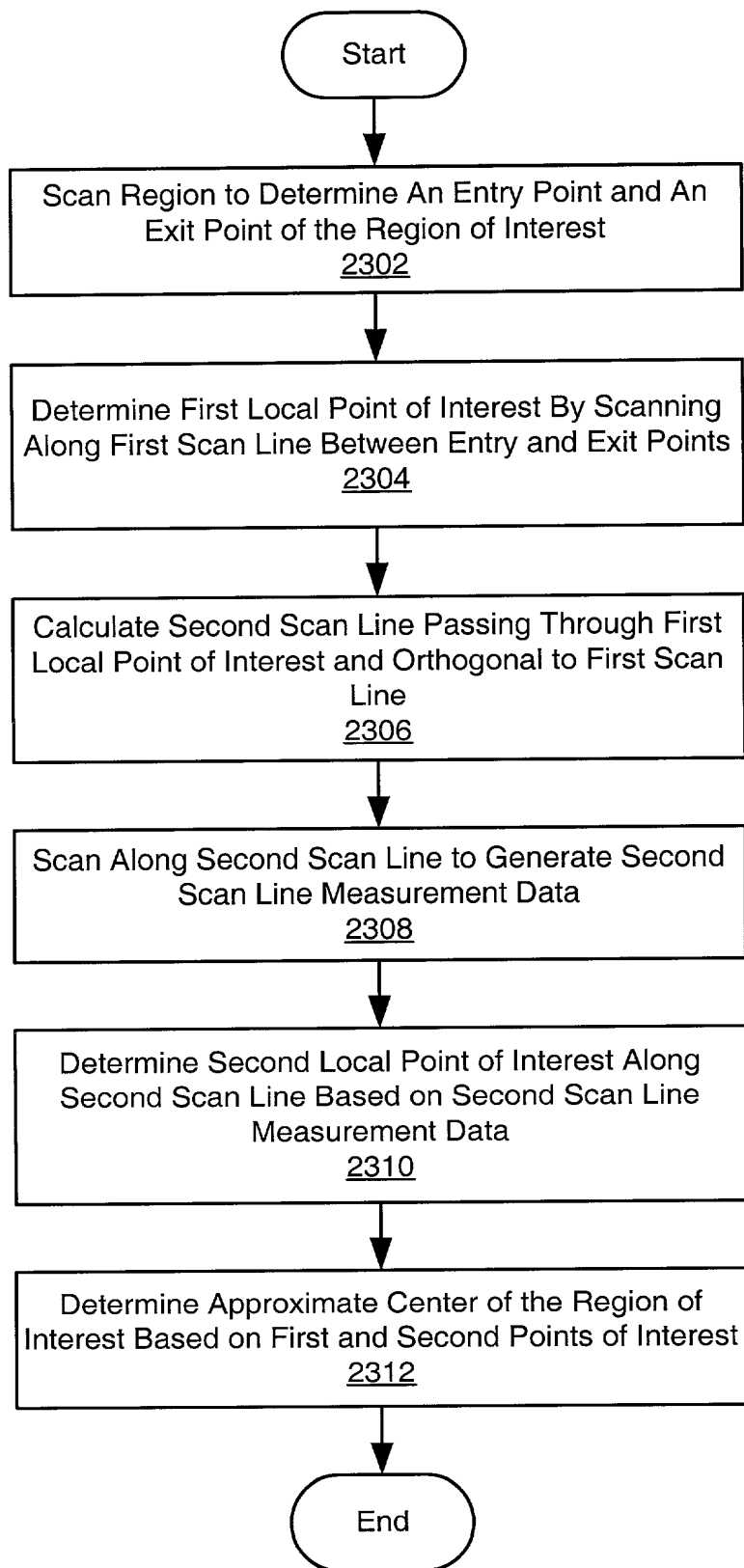


Figure 23